

SP-700 series 33 channel instrumentation recorders/reproducers



GENERAL DESCRIPTION

The standard SP700 is capable of three different modes of recording on each of its four magnetic tracks: TIME SHARED, FREQUENCY MODULATION and VOICE. Types of recording can be intermixed and varied to suit different applications simply by substituting plug-in electronics cards.

TIME SHARED Unique time shared recording on the SP700 allows up to 30 multiplexed input channels to be recorded on one magnetic tape track. Time shared electronics sample each input 30 times/second and allow reconstruction of nominal 5Hz data. Standard output electronics incorporate a "sample-and-hold" card for any 5 of the 30 input channels; this provides a nearly analog equivalent of the input to drive readout devices.

FM The standard SP700 can record and reproduce up to four FM channels, each with response from dc to 2.5kHz. Two electronics cards and one magnetic tape track are required for each FM channel. FM recording on the SP700 offers exceptionally good signal-to-noise and is useful for recording low-level acoustic noise, EKG, EEG, vibration, and similar measurements.

VOICE The standard SP700 provides space for one voice electronics card, allowing voice annotation or time reference to be recorded on one magnetic track. An output on the front panel provides power for an external, low-impedance speaker in audio playback.

SPECIFICATIONS

TAPE SPEEDS:

7 1/2, 3 3/4, 1 1/2 inches per second standard; transport speed control also switches FM center frequency unit for each speed.

TAPE SPEED DEVIATION:

0.25% maximum, long terms, with constant 60Hz or 50Hz source.

REELS AND TAPE:

7" plastic reels standard, 1/4" width; 1.0 or 1.5-mil acetate or polyester base.

FM RECORDING

FREQUENCY RESPONSE:

Tape Speed	Frequency Response (±1 db)	RMS* S/N Ratio
1 7/8 ips	0 to 625Hz	43 db
3 3/4 ips	0 to 1250 Hz	44 db
7 1/2 ips	0 to 2500 Hz	45 db

*RMS S/N ratio at center carrier

PHYSICAL CHARACTERISTICS

POWER REQUIREMENTS:

115VAC ±10%, 60Hz single phase; 230 VAC ±10%, 50Hz single phase; 100VA maximum.

TEMPERATURE AND HUMIDITY:

32°F to 110°F operating; 0% to 85% R.H., non-condensing.

DIMENSIONS:

20" x 13 1/2" x 8"

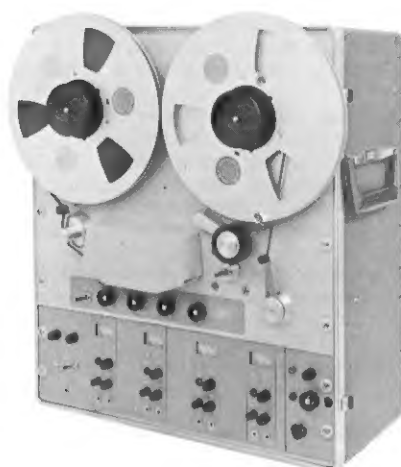
WEIGHT:

38 pounds approximately (with 3 FM record/reproduce and 1 voice channel).

SP700 SYSTEMS DESCRIPTIONS	CODE	SELLING PRICE TO GOVERNMENT	
		1-4	5+
One channel Record/Reproduce System, to include: One A01 transport assembly One E01 FM record, single channel One F01 FM reproduce, single channel One J07 operations manual	S01	2228.00	2181.00
Two channel Record/Reproduce System, to include: One A01 transport assembly Two E01 FM record, single channel Two F01 FM reproduce, single channel One J07 operations manual	S02	2798.00	2739.00
Three channel Record/Reproduce System, to include: One A01 transport assembly Three E01 FM record, single channel Three F01 FM reproduce, single channel One J07 operations manual	S03	3368.00	3297.00
Four channel Record/Reproduce System, to include: One A01 transport assembly Four E01 FM record, single channel Four F01 FM reproduce, single channel One J07 operations manual	S04	3938.00	3855.00

NOTE: Codes A02 or A03 may be substituted for A01 above.

SP700 COMPONENTS	CODE	SELLING PRICE TO GOVERNMENT	
		1-4	5+
Transport, Basic Unit, 115V, 60Hz	A01	1648.00	1614.00
Transport, Basic Unit, 115V, 50Hz	A02	1648.00	1614.00
Transport, Basic Unit, 200-250V, 50Hz	A03	1648.00	1614.00
TDM Record (30 channels)	B01	950.00	930.00
TDM Reproduce (30 channels)	C01	827.00	809.00
FM Record	E01	228.00	223.00
FM Reproduce	E02	342.00	335.00
Voice Record/Reproduce	G01	124.00	121.00
Calibration Tape	J05		20.00
Extender Card	J06		50.00
Operations Manual	J07		10.00
Operations/Maintenance Manual	J08		20.00
Microphone	J09		10.00

instrumentation recorders/reproducers
SP-300 series

 SP-300 Instrumentation Recorder
4-channel 1/4-inch

 SP-300 Instrumentation Recorder
7-channel 1/2-inch

MODEL	NUMBER OF AMPLIFIERS	SPEEDS (ips)	ORDER BY CODE NUMBER		SELLING PRICE TO GOVERNMENT
			50 cps	60 cps	
SP-300 FOUR TRACK 1/4" TAPE	One	1 7/8	A-12	A-01	3292.00
	Two	3 3/4	A-13	A-02	3838.00
	Three	7 1/2	A-14	A-03	4384.00
	Four	15	A-15	A-04	4741.00
SP-300 SEVEN TRACK 1/4" TAPE	One	1 7/8 3 3/4 7 1/2 15	A-16	A-05	3515.00
	Two		A-17	A-06	4061.00
	Three		A-18	A-07	4608.00
	Four		A-19	A-08	5154.00
	Five		A-20	A-09	5700.00
	Six		A-21	A-10	6246.00
	Seven		A-22	A-11	6603.00
SP-300 SEVEN TRACK 1/2" TAPE (IRIG std.)	One	1 7/8 3 3/4 7 1/2 15	A-30	A-23	4940.00
	Two		A-31	A-24	5486.00
	Three		A-32	A-25	6033.00
	Four		A-33	A-26	6579.00
	Five		A-34	A-27	7125.00
	Six		A-35	A-28	7671.00
	Seven		A-36	A-29	8028.00

NOTES: a. Mounting: Normally supplied with case; can be rack-mounted.
b. Purchaser must order by description and 50 or 60 cps code number.

SP-300 COMPONENTS AND ACCESSORIES

ITEM	CATALOG NUMBER	SELLING PRICE GOVERNMENT
TRANSPORT, 60 cycle — 1/4"	103130-120	1378.00
TRANSPORT, 50 cycle — 1/4"	103130-130	1378.00
TRANSPORT, 60 cycle — 1/2"	103130-150	2553.00
TRANSPORT, 50 cycle — 1/2"	103130-160	2553.00
HEAD ASSEMBLY, Record/Reproduce 4-track, in-line 1/4"	1815001-02	903.00
HEAD ASSEMBLY, Record/Reproduce 4-track, staggered 1/4"	1815001-03	903.00
HEAD ASSEMBLY, Record/Reproduce 7-track 1/4"	1815001-01	1283.00
HEAD ASSEMBLY, Record/Reproduce 7-track IRIG — 1/2"	1815018-01	1283.00
AMPLIFIER ASSEMBLY, Record/Reproduce	100512-080	546.00
ELECTRONIC CARD RACK — 1/4"	100510-140	599.00
CASE	100476-010	71.00
CASE, front cover	100472-010	38.00
CASE, rear panel	103985-020	10.00
INSTRUCTION MANUAL — 1/4"	48814-020	21.00
INSTRUCTION MANUAL — 1/2"	48814-30	21.00
ALIGNMENT TAPE — 1/4"	103400-010	14.00
ALIGNMENT TAPE — 1/2"	103400-020	34.00
REEL ROTATION COUNTER KIT — 1/2"	1800427-01	142.00
MODULE EXTENSION CABLE	1800240-01	71.00
DUMMY AMPLIFIER CARD	100505-01	5.00

DESCRIPTION

Combines the advanced techniques of Ampex's larger, more complex instrumentation recorders with portability, compactness, and economy. Direct, FM, and audio recording facilities are available. Uses standard 1/4-inch or 1/2-inch tape to provide from one to seven recording channels. Has electrically switched amplifiers, built-in calibration, full-track erase head supplied on 1/4-inch tape units only. Truly portable (weighs 85 lbs., measures 22" x 13" x 19 1/8". 105 lbs. for 1/2" version.)

SPECIFICATIONS

TAPE SPEED: 1 7/8, 3 3/4, 7 1/2 and 15 ips, electrically switched.

TAPE SPECIFICATIONS: Versions for 1/4 or 1/2-inch tape, 1 or 1 1/2 mil base polyester or acetate on 10 1/2-inch NAB or 7-inch plastic reels (1/4-inch only).

HEADS: 4 or 7-track on 1/4-inch tape; 7-track on 1/2-inch tape.

RECORDING MODES: Direct, FM and audio, electrically switched.

FREQUENCY RESPONSE: Direct: 50 to 40 Kc ± 3 db at 15 ips.

FM: DC to 2.5 Kc within 1.0 db at 15 ips.

instrumentation recorders/reproducers

PR-500 series

GENERAL DESCRIPTION

The Ampex PR-500 is a new low priced portable or rack mounted instrumentation recorder that can bring the advantages of magnetic recording to industry, medicine, education, and science.

FEATURES

- Full seven channel record and reproduce system in a compact package.
- FM Recording technique with frequency response to 10 kHz.
- Direct recording technique with frequency response to 150 kHz.
- ES-100 modules plug-in interchangeable with eight other Ampex models.
- Separate record and reproduce modules allow you to tailor make a system to meet your own requirements.
- Servo system provides six electrically switched speeds, assures speed accuracy even under varying line frequencies.
- 32 to 1 speed range from 15/16 to 30 ips brings 10 kHz data within reach of pen recorders, speeds up low frequency data to take full advantage of high speed data processing.
- 12½ hours of playing time captures long experiments in process monitoring or similar applications.
- Relay-operated squelch prevents chattering of chart recorder pens when no data is present.
- Special edge track for voice annotation (½ inch version) in addition to seven data channels.
- IRIG compatible track spacing and head geometry assure compatibility with other ½ inch tapes and data processing requirements.
- Field convertible from ½-inch seven channel to ¼-inch two, four, or seven channel.

TAPE TRANSPORT

Tape Speeds: 15/16, 1-7/8, 3-3/4, 7-1/2, 15, and 30 ips standard. All six transport speeds are selected by a single front panel control. All speeds are synchronously controlled by a phase-locked capstan servo system.

Reels: The PR-500 tape transport accommodates 10½-inch reels for ¼ or ½-inch tape—Ampex Precision or NAB.

Tape Specifications: The standard transport is convertible for either ¼ or ½-inch tape of 1 mil or 1.5 mil Polyester, or 1.5 mil Acetate tape. Stated performance guaranteed only when using recommended Ampex Instrumentation Tape.

Start Time: Time required from start command to meet flutter specifications is 7 seconds at 30 ips. Only 5 seconds is required to reach servo synchronization. Shorter start time at lower speeds.

Flutter*: Maximum cumulative flutter (% peak-to-peak).

Tape Speed (ips)	Bandpass (Hz)	Flutter (%)
30	0.2 to 5,000	0.6
15	0.2 to 2,500	0.6
7-1/2	0.2 to 1,250	0.75
3-3/4	0.2 to 625	0.75
1-7/8	0.2 to 312	1.0
15/16	0.2 to 156	2.0

*Measured per IRIG 106-66, paragraph 5.6.3.2.3 (2-sigma limit).

HEADS—½-INCH IRIG VERSION

Track Dimensions: Track width is 0.050 inch; track spacing 0.070 center (IRIG Standard).

Number of Tracks: Seven plus voice edge track per IRIG Standards.

Interstack Spacing: 1.500 inches ±0.001 inch.



HEADS—¼-INCH VERSION

Track Dimensions: Track width is 0.024 inch; four channel track spacing 0.072 inch on center; seven channel track spacing 0.035 inch on center; two channel track spacing 0.140 on center. Head track width 0.035 inch on center; two channel track spacing 0.050 inch track width and 0.140 inch on center.

Number of Tracks: Seven

Interstack Spacing: 1.219 inches ±0.001 inch.

DIRECT RECORD/REPRODUCE SYSTEM

Frequency Response:

Tape Speed (ips)	Bandwidth +3 dB	Bandpass *Filtered	Unfiltered
30	100 Hz to 150 kHz	34	30
15	100 Hz to 75 kHz	32	27
7-1/2	50 Hz to 38 kHz	30	22
3-3/4	50 Hz to 19 kHz	29	22
1-7/8	50 Hz to 10 kHz	28	22
15/16	50 Hz to 5 kHz	27	22

*Measured at output of a bandpass filter having 18 dB/octave attenuation beyond limits stated.

Input Level: 1.0 volt rms nominal (0 dBv) to produce normal recording level.

Input Impedance: Nominal 20K ohms resistive minimum in parallel with 150 pF, unbalanced to ground.

Output Level: 1.0 volt rms nominal (0 dBv), across a 600 ohms or greater impedance.

Output Impedance: Less than 50 ohms, unbalanced to ground.

(Continued on overleaf)

instrumentation recorders

FR-1300/AR200 series



SPECIFICATIONS:

Tape Speeds: 1 $\frac{1}{8}$, 3 $\frac{3}{4}$, 7 $\frac{1}{2}$, 15, 30, 60 ips standard.

Tape Specifications: $\frac{1}{2}$ or 1-inch versions, 10 $\frac{1}{2}$ -inch reels.

Heads: 7 on $\frac{1}{2}$ inch, 14 on 1 inch.

Recording Modes: Direct, FM, PDM (IRIG compatible).

Frequency Response: Direct: 300 cps to 300 KC ± 3 db.

FM: DC to 20 KC within 1.0 db. IRIG compatible PDM.

FR-1300 INSTRUMENTATION RECORDER/REPRODUCER

... the smallest portable 14-track recorder, yet (24 x 18 x 12 $\frac{1}{2}$ inches), offering outstanding instrumentation performance with 300 KC on Direct, 20 KC on FM and IRIG compatible PDM.

APPLICATIONS:

Full instrumentation capabilities including plug-in amplifiers and heads makes this an ideal recorder for field and laboratory use. Useful for telemetry, materials testing, process control and testing, and related applications in manufacturing, chemical, aircraft, petroleum, medical and aerospace installations.

FEATURES:

New transport design based on refinements and improvements of time-proven Ampex systems. Unique capstan servo system insures speed accuracy under varying frequency and phase conditions. Electrical switching selects 6 speeds from a single, front panel control. Tape threading is simplified, straight-line path. Tape lifters reduce head wear in fast modes; can be defeated for high speed search. Controls are interlocked to positively prevent tape damage. Available in a rack-mounted version. Uses Ampex's solid-state ES-100 electronics.

AMPEX FR-1300 Instrumentation Recorder/Reproducer— $\frac{1}{2}$ -inch (1.27 cm), 7-Track, IRIG Heads, 7 Direct Record Amps, 7 Direct Reproduce Amps, 7 Direct Reproduce Equalizers

SELLING PRICE:
\$9,030.00



SPECIFICATIONS:

Tape Speeds: 6 speeds in 3 ranges from 1 $\frac{1}{8}$ to 60 ips

Tape Specifications: Models for $\frac{1}{2}$ or 1 inch tape on 10 $\frac{1}{2}$ inch reels

Heads: 7 analog or 8 digital on $\frac{1}{2}$ inch tape

14 analog or 16 digital on 1 inch tape

Recording Modes and Response: Direct, FM, PDM and NRZ digital

Direct Response — 300 cps to 250 kc

AR-200 AIRBORNE AND MOBILE INSTRUMENTATION RECORDER

... a recorder specifically designed for airborne and mobile use ... direct recording to 250 kc, also FM, PCM and PDM capabilities.

APPLICATIONS:

The compact, rugged construction of the AR-200 makes it an ideal instrumentation recorder wherever difficult environmental conditions exist — for flight test, field, or vehicle-mounted applications.

FEATURES:

The AR-200 is completely militarized and ruggedized. Because it weighs only 120 pounds and occupies only 1.9 cubic feet, it can be easily mounted in aircraft or mobile units. It performs reliably from -54°C to $+60^{\circ}\text{C}$, at altitudes of 80,000 feet. Sturdy construction and shock mounting takes shocks to 15 g's or 10 g's of vibrations. Plug-in, solid-state electronics are contained in special ruggedized cases, 7 amplifiers to a case. Power required is 28 VDC. Accessories include: remote control unit, reproduce head and monitoring bays, and power converters.

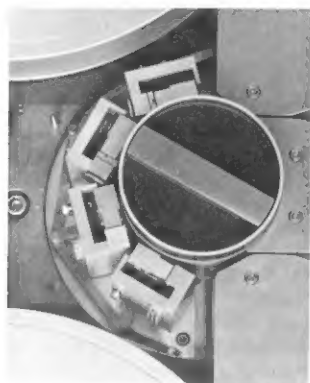
DESCRIPTION OF TYPICAL SYSTEM:

Ampex AR-200 Airborne/Mobile Instrumentation Recorder, $\frac{1}{2}$ inch, 7 track, IRIG heads, 7 channels direct record, includes remote control.

SELLING PRICE: \$16,230.00

1.5MHz instrumentation recorder

FR-1800L series



FR-1800 zero loop capstan. Capstan is the only rotating element in the tape path. Tape is locked to the capstan. All pinch rollers, idlers, and rotating guides are eliminated. Heads are IRIG compatible, and plug-in interchangeable. The reproduce heads have adjustable azimuth.

TAPE TRANSPORT

Completely new transport design for high performance.

With the FR-1800, Ampex introduces to the instrumentation field a new transport featuring a fast response servo, zero loop capstan and pneumatic chute guides.

This unique new combination of tape control elements offers a new standard in low time base error, flutter, and interchannel time displacement error. Coupled with field proven electronics, the FR-1800 represents an outstanding magnetic tape recorder, destined to become the workhorse of the industry, because of its performance and reliability.

TAPE SPEEDS: Discrete by switch selection (or continuously variable with external oscillator in tach mode). Discrete Speed Selection: Seven Speeds: 120, 60, 30, 15, $7\frac{1}{2}$, $3\frac{3}{4}$, or $1\frac{7}{8}$ inches per second, tape speeds and forward, reverse drive directions electrically selectable.

FAST WIND TIME: Fast forward and reverse for 14 inch reel with 5000 feet of tape is less than 3.5 minutes. Tape is continuously under capstan control. Tape speed never exceeds 360 inches per second.

HEADS: Comply with IRIG 106-65 for 7 tracks with $\frac{1}{2}$ " tape or 14 tracks with 1" tape.

Fail-safe servo minimizes time base errors, provides seven-speed bidirectional operation, electrically switched. Reference is selectable, crystal standard or control track. Loss of control track signal automatically switches servo to internal reference.

FR-1800 chute guides. Positive air pressure within the chutes cushions tape and provides decoupling between reels and capstan to eliminate effects of motion or tension perturbations.

FR-1800L

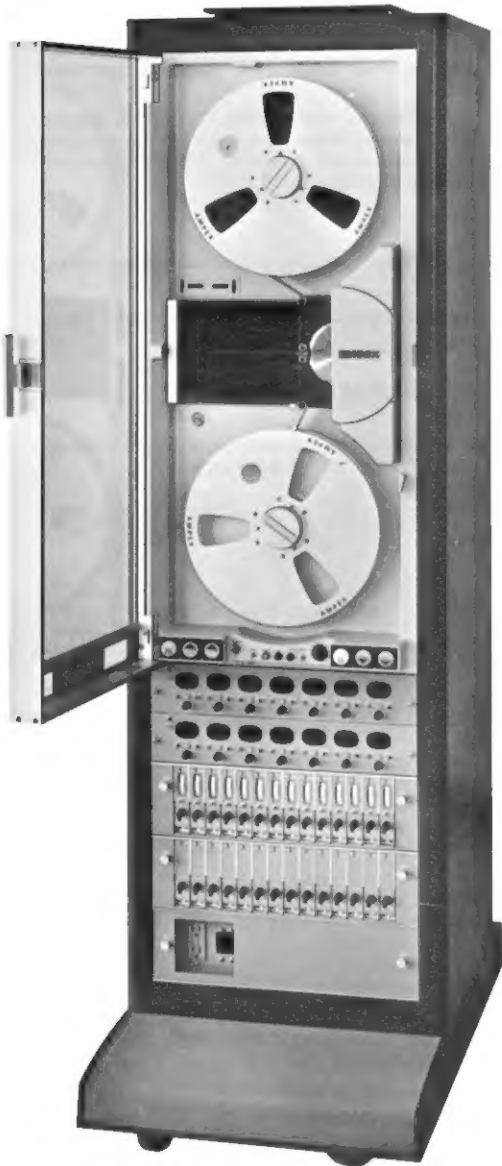
	$\frac{1}{2}$ " Version 7 channel	1" Version 14 channel
*TRANSPORT, HEAD ASSY, ELECTRONIC BAYS	\$12,280.00	\$13,625.00
300 KC DIRECT RECORD AMPLIFIER Unit Price: \$130	910.00	1,820.00
300 KC DIRECT REPRODUCE AMPLIFIER Unit Price: \$65	455.00	910.00
REPRODUCE EQUALIZER order one per channel for each speed ($1\frac{7}{8}$ through 60 ips) example: 2 speeds — 7 channel 2 speeds — 14 channel Unit Price: \$40	560.00	1,120.00
20 KC FM-RECORD AMP., 6 SPEED manually switchable, Unit Price: \$110	770.00	1,540.00
20 KC FM-REPRODUCE AMPLIFIER Unit Price: \$140	980.00	1,960.00
FM-REPRODUCE OUTPUT FILTER order one channel per each speed ($1\frac{7}{8}$ through 60 ips) example: 2 speeds — 7 channel 2 speeds — 14 channel Unit Price: \$40	560.00	1,120.00

*also including: Cover Door; Preamplifier Housing; Control Track Filter Assy; 1 Reel of Tape; 1 Empty Reel; Head Degausser and Instruction Manuals.

FR-1800 ACCESSORIES

Rack Dolly	\$255.00
Footage Counter (with shuttle)	250.00
Remote Control	960.00
Filler Panels Unit Price	17.00
Voice Monitor (FR-1800L only)	550.00

instrumentation recorder FR-1600 series



GENERAL DESCRIPTION

The Ampex FR-1600 recorder/reproducer system is a new, reliable, high performance instrumentation recorder particularly suitable for the most demanding applications where laboratory-type recorders are used. It provides up to seven tracks on $\frac{1}{2}$ inch tape or up to fourteen tracks on one inch tape with the following recording techniques: 2.0 MHz Direct, and 400 kHz FM. System design emphasizes reliability, ease of operation and serviceability. A complete 14-track system can be housed in a single rack. Built-in features include a fast response capstan servo, Acculoop[®] capstan drive, vacuum tape buffers and bi-directional operation. Additional optional features, accessories and custom modifications are available to satisfy every need.

PHYSICAL CHARACTERISTICS

Size: Single cabinet: 75 inches (191 cm) high by 22 $\frac{1}{4}$ inches (57 cm) wide by 25 $\frac{1}{2}$ inches (65 cm) deep. Rack dolly adds 4 inches (10 cm) to overall height.

Weight: Approximately 800 pounds (36 kg) for a 14-track system in a single rack cabinet.

Tape Speeds: Eight speeds, bi-directional—240, 180, 120, 60, 30, 15, 7 $\frac{1}{2}$, and 3 $\frac{3}{4}$ ips. Electrically selected with rotary switch.

Reels: 16, 15, 14, or 10 $\frac{1}{2}$ inch precision reels.

FR-1600

	$\frac{1}{2}$ " Version 7 channel	1" Version 14 channel
TRANSPORT, HEAD ASSY, ELECTRONIC BAYS RACK CABINET 66$\frac{1}{2}$"	\$28,550.00	\$35,070.00
2 MC DIRECT RECORD AMPLIFIER WITH METER Unit Price: \$200	1,400.00	2,800.00
2 MC DIRECT REPRODUCE AMPLIFIER WITHOUT METER	3,150.00	6,300.00
REPRODUCE EQUALIZER order one per channel for each speed (120 through 3 $\frac{3}{4}$ ips) example: 2 speeds — 7 channel 2 speeds — 14 channel Unit Price: \$125	1,750.00	3,500.00
DIRECT REPRODUCE PREAMPS order one per channel, Unit Price: \$40	280.00	560.00
DIRECT REPRODUCE DUAL LINE AMPLIFIER order one for each 2 channels, Unit Price: \$250	1,000.00	1,750.00

FR-1600 ACCESSORIES

Remote Control Panel	\$ 350.00
Monitor Panel CRT	3,500.00
Rack Dolly	255.00
Blank Panel	10.00
Filler Panel 1 $\frac{3}{4}$ "	10.00
Filler Panel 3 $\frac{1}{2}$ "	15.00
Filler Panel 5 $\frac{1}{4}$ "	20.00
Filler Panel 7"	20.00
Conversion Kit $\frac{1}{2}$ " to 1" or 1" to $\frac{1}{2}$ " Tape width	450.00
Reproduce Amplifier Dummy S-06	10.00

instrumentation recorder
AR-1600 series

GENERAL DESCRIPTION

The AR-1600 is a new, compact wideband multichannel recorder/reproducer designed for airborne and other stringent environments. It is ruggedly constructed, uses servo-controlled time base correction and may be electrically switched over a range of six speeds. Up to seven channels of record and reproduce electronics are provided on machines using $\frac{1}{2}$ " tape, on $10\frac{1}{2}$ " or 14" precision reels, or up to 14 channels on machines equipped for 1" tape. Standard electronics provide 2 MHz response at 120 ips.

The system design emphasizes small size, ease of operation and serviceability. Closed loop capstan design, concentric reels and a fast response capstan servo are featured. The AR-1600 is designed for remote sequential operation for those needing uninterrupted recording. Additional optional features and custom modifications are available to satisfy every need.

AR-1600

Tape Speeds: Six speeds—120, 60, 30, 15, $7\frac{1}{2}$, and $3\frac{3}{4}$ ips. Electrically selected with rotary switch.

Reels: 14 inch or $10\frac{1}{2}$ inch, precision reels.

Input Impedance: Greater than 1000 ohms. Shunts are provided to give 75 ohms and 91 ohms. Other impedances available on special order.

Input Level: 0.25 to 10v zero-to-peak, adjustable.

Output Impedance: 75 ohms or 91 ohms nominal (changeable by strapping).

Output Level: 0–3v p-p adjustable across 75 ohm load.

Tape Specifications: Either $\frac{1}{2}$ or 1 inch tape of 1 mil or $1\frac{1}{2}$ mil polyester base. Stated performance and warranty are guaranteed only when using Ampex recommended tape.

Heads: Head geometry per IRI 106-65.

SIGNAL ELECTRONICS

2.0 MHz Record/Reproduce System:

FREQUENCY RESPONSE:

Tape Speeds (ips)	Bandwidth (± 3 dB)	S/N (RMS Signal to RMS Noise)* (at 3% 3rd Harmonic Distortion of 20 KHz Record Level set Frequency)
120	800 Hz-2 MHz	20 dB
60	400 Hz-1 MHz	20 dB
30	400 Hz-500 KHz	20 dB
15	400 Hz-250 KHz	20 dB
$7\frac{1}{2}$	400 Hz-125 KHz	20 dB
$3\frac{3}{4}$	400 Hz-62.5 KHz	20 dB

*Measured at output of a bandpass filter having 18 dB/octave attenuation beyond limits stated, and down no more than 3 dB at band edges.

HARMONIC DISTORTION: Less than 2% total harmonic distortion of any signal in the passband when recorded at an input signal level which produces 1% third harmonic distortion of a 20 KHz signal at 120 ips.

PHYSICAL CHARACTERISTICS

SIZE: 1. Transport— $24\frac{1}{2}$ " vertical space in standard 19" rack. Overall depth $14\frac{1}{2}$ " on portable version. Overall depth on AR, $12\frac{1}{2}$ " back of rack mounting flange. Overall depth $14\frac{1}{2}$ ".

2. Servo and Power Unit— $5\frac{1}{4}$ " vertical space in standard 19" rack. Depth back of rack mounting flange 11". Overall depth $13\frac{1}{8}$ ".

WEIGHT: 1. Transport (including 14-track record/reproduce electronics) 99 lbs.

2. Servo and Power Unit— $25\frac{1}{2}$ lbs.

	$\frac{1}{2}$ " Version 7 channel	1" Version 14 channel
TRANSPORT, HEAD ASSY, CARD RACKS, MOUNT CASE	\$27,253.00	\$32,167.00
2 MHz DIRECT RECORD AMPLIFIER ALL SPEEDS		
order one dual amplifier for two channels, Unit	Unit Price: \$165	660.00
2 MHz DIRECT REPRODUCE AMPLIFIER 4 SPEEDS	Unit Price: \$465	3,255.00
DIRECT REPRODUCE EQUALIZER		
example: 4 speeds — 7 channels (120, 60 ips)		
4 speeds — 14 channels (120, 60 ips)		
order one per channel for each speed required	Unit Price: \$200	2,170.00
PREAMPLIFIERS		
must be ordered with reproduce electronics	Unit Price: \$ 85	595.00
ACCESSORIES		
Converter 208 V, 3 Φ		445.00
Converter 110 V, 50/60 cps		1,455.00
Remote Control Unit		645.00
Sequential Remote Control Unit		2,477.00